



SCHOOL OF PHARMACY & HEALTH SCIENCES

COURSE: ENV 3300 ENERGY USE AND MANAGEMENT

1. COURSE DESCRIPTION

The non-science majors learn about, important energy issues affecting the global society. Topics include energy resources (renewable and non-renewable), their global demand and distribution, effect of their use on the environment and human health, energy policies and sustainable energy development.

2. LINK TO UNIVERSITY MISSION OUTCOMES AND PROGRAM LEARNING OUTCOMES:

1. Higher Order Thinking
 - Collect, analyze and evaluate energy data/information to formulate valid conclusions
 - Demonstrate the ability to reason critically and creatively in an interdisciplinary context
2. Literacy
 - Apply basic scientific, quantitative and technological skills in managing diverse energy resources and increasing energy needs.
3. Preparedness for career
 - Apply intellectual knowledge to practical tasks

3. EXPECTED COURSE LEARNING OUTCOMES

By the end of the course the student should be able to:

- a. Explain the meaning of energy.
- b. Describe the importance of energy in the modern society.

- c. Give an account of the different types of energy resources available for use in world today.
- d. Describe the positive and negative effects of each energy resource and give a recommendation on each
- e. Discuss environmental problems associated with the use of different energy resources.

4.0 COURSE CONTENT & CLASS SCHEDULE:

WEEK ONE

- a) Learning Outcome:
To explain the molecular and atomic structures of matter and changes in matter that generates energy
- b) Topic/ sub-topic:
What is matter? Building blocks of nature. Elements and Compounds
Molecules, Atoms and Ions
- c) Readings (course text Pages 54-58):

WEEK TWO

- a.) Learning Outcome:
To describe energy classification and its measurement
- b) Topic/ sub-topic: Units of energy
Types of energy: potential and kinetic energy
- c) Readings (course text Pages 332-332, 358-370, 54-58)
- d) *ASSIGNMENT: DISCUSS THE GLOBAL OIL CRISIS AND IT EFFECT ON THE KENYAN ECONOMY*
DUE DATE: 01/02/2018

WEEK THREE

- a.) Learning Outcome:
To explain energy changes and energy efficiency
- b) Topic/ sub-topic:
Chemical and physical changes)
Laws of energy
Energy efficiency and Net energy
- c) Readings (course text Pages 332-340, 358-370):

WEEK FOUR

- a) Learning outcomes
To discuss the non-renewable energy resources: Nuclear energy
- b) Topic/ sub-topic:
Nuclear changes (Natural radioactivity, Nuclear fission, Nuclear fusion)
Nuclear fission reactor, Nuclear fuel cycle
Evolution of nuclear power, Lessons learnt and future of nuclear energy
Advantages and disadvantages of nuclear energy

c) Readings Pgs 61-65 and 344-355

Quiz 1

WEEK FIVE

a) Learning outcomes

To discuss the non-renewable energy resources: Crude oil

b) Topic/ sub-topic:

Crude oil formation, extraction, processing and use.

Global distribution of crude oil reserves and approximate lifespan

Trends in global oil demands and the energy crisis

Advantages and disadvantages of oil use

c) Readings Pages 355-360

d) Research on

WEEK SIX

a) Learning outcomes

To discuss the non-renewable energy resources: Coal

b) Topic/ sub-topic:

Formation, extraction, processing and use of coal

Global distribution of coal deposits and approximate lifespan.

Advantages and disadvantages coal mining and use.

c) Readings Pages 342-344

WEEK SEVEN

a) Learning outcome

To discuss the non-renewable energy resources: Natural gas

b) Topic/ sub-topic:

Natural gas formation, extraction and use.

Global natural gas reserves and approximate lifespan

c) Readings Pages 340-342

MID QUARTER EXAMS

WEEK EIGHT

a) Learning outcomes

To explain the effects of non-renewable energy resources on the environment

b) Topic/ sub-topic:

Atmospheric energy balance

Global warming and its effects

Mitigating and adapting to global warming

Air pollution and human health

c) Readings Pages 447-457

WEEK NINE

a) Learning outcomes

To give an account of the renewable energy resources: Biomass and Electricity

- b) Topic/ sub-topic:
 - Burning solid biomass
 - Liquid and gaseous biomass fuels
 - Advantages and disadvantages
 - Electricity from running water
 - Large scale and small scale hydropower
- c) Readings (pages 365-366, 384-388)

WEEK TEN

- a) Learning outcomes
 - To discuss the renewable energy resources: Geothermal, Wind and Hydrogen
- b) Topic/ sub-topic:
 - Wind energy and geothermal energy
 - Advantages and advantages
 - Hydrogen energy, Fuel cell
 - Hydrogen energy and the future
 - Advantages and disadvantages
- c) Readings (pages 365-366, 384-388)

QUIZ 2

WEEK ELEVEN

- a) Learning outcomes
 - To discuss the renewable energy resources
- b) Topic/ sub-topic:
 - Solar energy
 - Sustainable energy strategy
 - Renewable energy and the environment
- c) Readings Pages 370-378

WEEK TWELVE

- a) Learning outcomes
 - To describe the national energy legislations
- b) Topic/ sub-topic:
 - Policies and Regulations
- c) Readings (Copy of the Kenyan energy policy)

WEEK THIRTEEN

- a) Learning outcomes
 - To explain the national energy legislations
- b) Topic/ sub-topic:
 - National energy strategy
 - Energy and the future
- c) Readings (copy of acts and policies)

GROUP WORK SUBMISSION

WEEK FOURTEEN

END OF SEMESTER EXAMINATIONS

5. COURSE TEACHING METHODOLOGIES

Interactive and participatory lectures, group discussions, online and library research, studies of legal cases, application of legal rules to hypothetical case scenarios, student presentations, and use of multi-media.

6. KEY INSTITUTIONAL AND ACADEMIC POLICIES

- Seven absences from class will result in an automatic grade F
- All references used to do assignments should be cited correctly
- Assignments should be done and submitted on the due dates shown
- No make ups are given for tests assignments and exams

7. COURSE TEXT AND OTHER READING MATERIALS

G. Tyler Miller, Living in the 14th Edition (Belmont: Wadsworth Pub. Co., 2009)

Other readings

1. Manfred Kleen (Editor & main author). Energy use and air pollution in Indonesia: Supply strategy, environmental impacts and pollution control. TD 195. E49E7. 1994
2. Goldemberg, Jose. Energy, Environment and Development. TD 195. E49985. 1996.
3. Examples of successful uses of renewable energy sources in the south/UNDP, special unit for technical cooperation among developing countries TWAS, TWNSO NY : UNDP 120p 2003. TJ 808.E93 2003

8. COURSE EVALUATION

Attendance and participation	10%
Quizzes	10 %
Individual Assignment	10%
Group Assignment	15%
Mid Semester Exam.	25%
Final examination	30%

9. GRADING SYSTEM

A	90-100	C	70-73	D+	64-66
A-	87-89	C-	67-69	D	62-63
B+	84-86	B-	77-79	D-	60-61
B	80-83	C+	74-76	F	0-59